# Global Information Grid
# End-to-End
# Systems Engineering
# Advisory Activity

## Mr Mike Kern
### GIG Senior Systems Engineer

## Office of the Assistant Secretary of Defense (Networks and Information Integration)
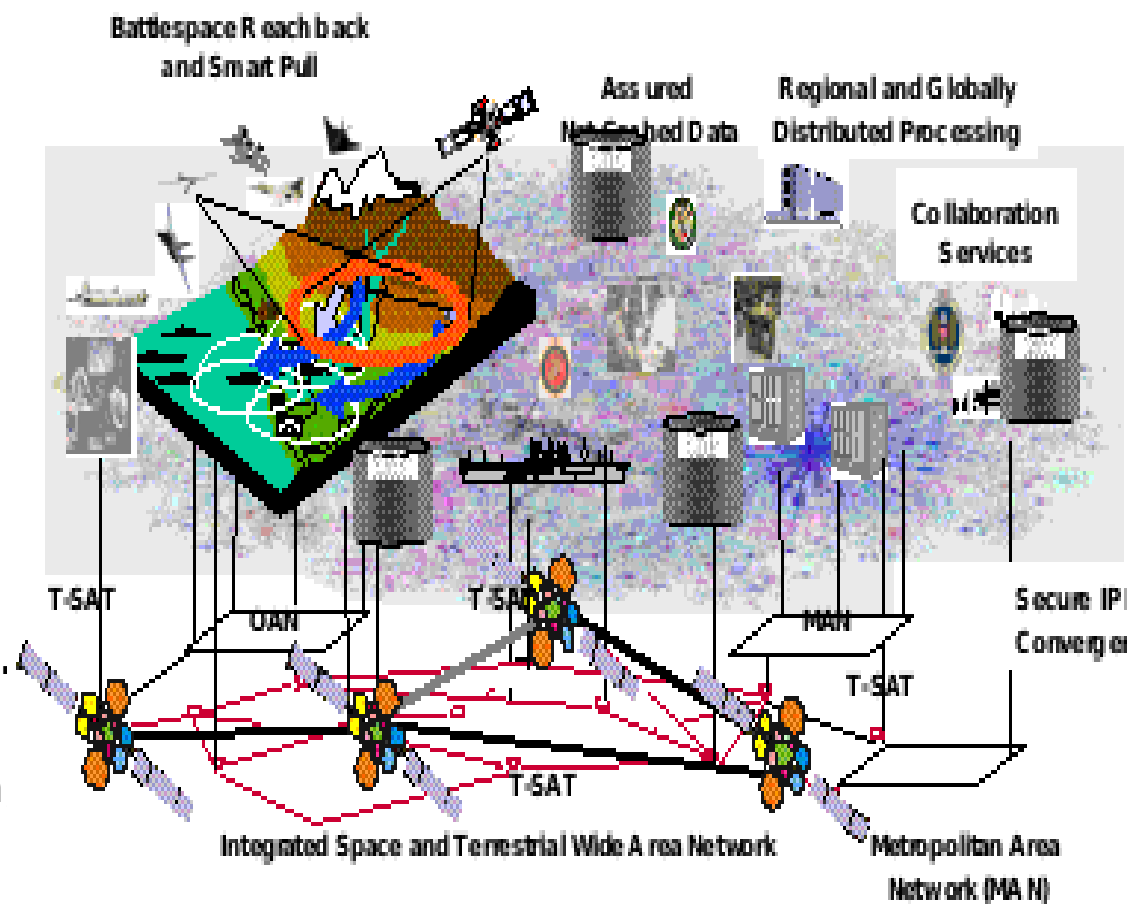
# *Engineering a Weapon System . . . . . .*

- **Procured by . . . .**
  - different people,
  - under different processes,
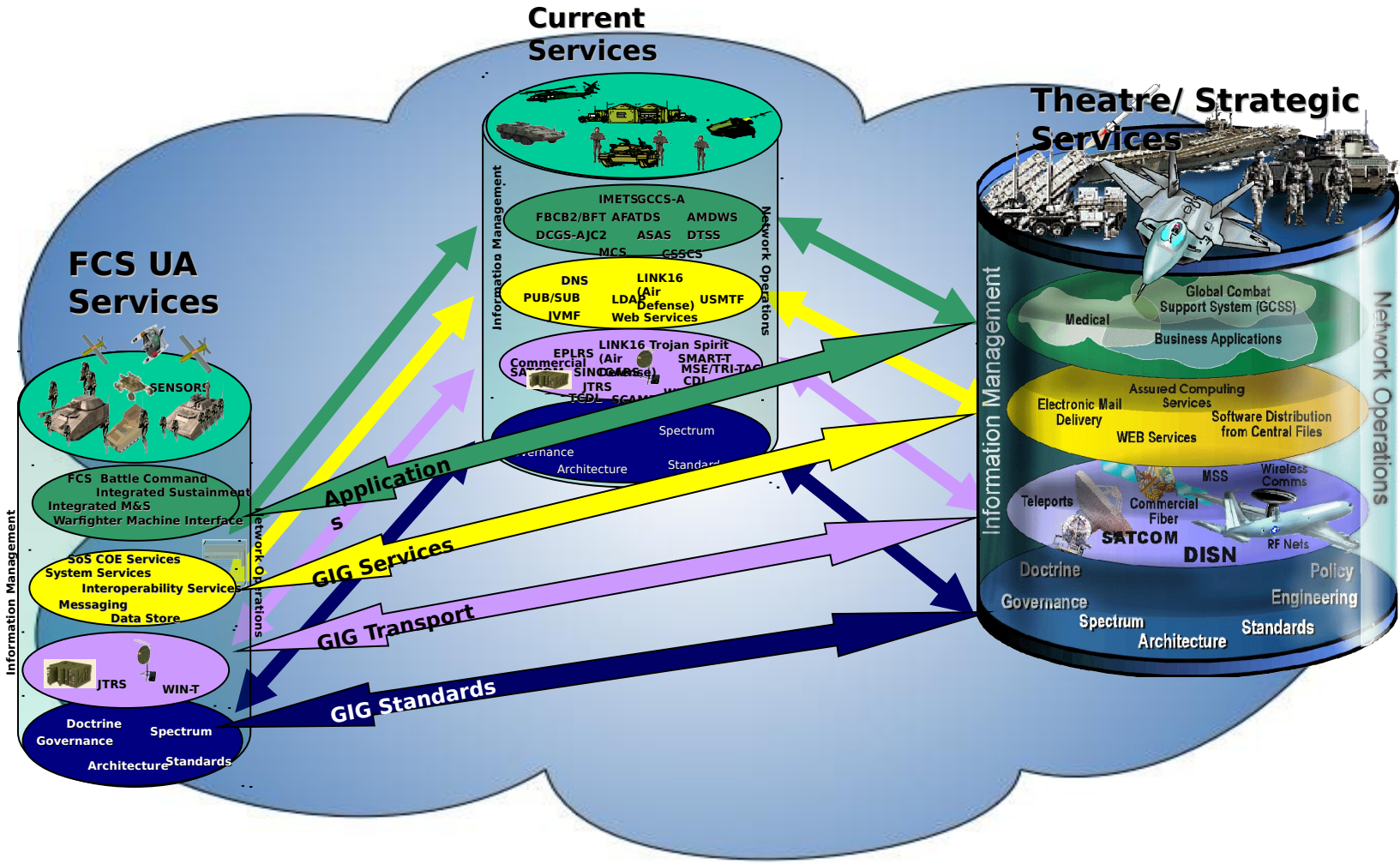  - with narrow objectives and requirements.

- **With a mission to provide . . .**
  - Virtual voice, data, video on
  - applications between individuals,
  - anywhere, any place, any



Battlespace Reach back and Smart Pull

Assured Networked Data

Regional and Globally Distributed Processing

Collaboration Services

T-SAT
UAN
T-SAT
MAN
Secure IP Converge
T-SAT

Integrated Space and Terrestrial Wide Area Network

Metropolitan Area Network (MAN)

*. . . e the functions, architect a solution, provide data at key decision . . .*

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# We must converge multiple programs into one capability . .



**Current Services**

**Theatre/ Strategic Services**

**FCS UA Services**

SENSORS

FCS Battle Command
Integrated Sustainment
Integrated M&S
Warfighter Machine Interface

SoS COE Services
System Services
Interoperability Services
Messaging
Data Store

JTRS        WIN-T

Doctrine
Governance        Spectrum
Architecture    Standards

Information Management

Network Operations

IMETSGCCS-A
FBCB2/BFT AFATDS    AMDWS
DCGS-AJC2    ASAS    DTSS
MCS    CSSCS

DNS    LINK16
PUB/SUB    (Air
LDA    Defense)    USMTF
IVMF    Web Services

EPLRS    LINK16 Trojan Spirit
Commercial    (Air
SA    SINCGARS Defense)    SMART-T
MSE/TRI-TAC
JTRS    CDL
TCDL    SGAM    Wideband

Spectrum
Governance
Architecture    Standards

Global Combat
Support System (GCSS)
Medical    Business Applications

Assured Computing
Services
Electronic Mail    Software Distribution
Delivery    from Central Files
WEB Services

MSS    Wireless
Teleports    Comms
Commercial
Fiber
SATCOM    RF Nets
DISN

Doctrine    Policy
Engineering
Governance
Spectrum    Standards
Architecture

Information Management

Network Operations

**Applications**

**GIG Services**

**GIG Transport**

**GIG Standards**

*. . . . and transition from our legacy systems quickly.* 3

# Key GIG tenants enable Transformational Warfare

- **Make information available**
  - Structure data for common posting, discovery and access
- **Provide lowest echelon users direct access to GIG**
  - IP based network for bandwidth sharing and robust routing
  - GIG-BE and IP-based TSAT creates a high-capacity core network
  - Affordable, JTRS common user access nodes for all connectivity
- **Provide dynamic provisioning and network operations**
  - Common network services for user authentication and net ops
  - "One time" provisioning that provides "turn on, log on" access
  - Embedded IP "smart terminals" with dynamic bandwidth sharing
- **Reduce operational footprint**
  - Service-oriented architecture reduces forward-deployed support
  - Core enterprise services for global functions (e.g., directory, discovery, etc)
- **Protect information while serving both US and Coalition operations**
  - HAIPE encryption for multilevel security across the network
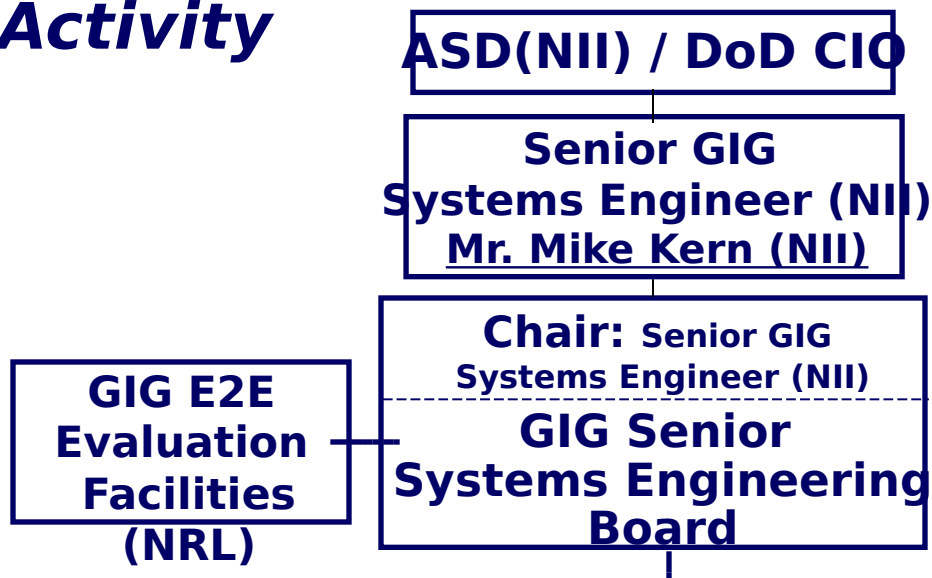  - Black core end-to-end network to allow dynamic routing & access

# GIG SE Is An Advisory / Decision Support Role

- **Make it simple** – **Define technical dependencies & solutions within GIG**

- **Make it functional** – **Flow down the needs for each segment of GIG**

- **Make it work** - **Technical products needed to assure net centric services**

- **Make it happen** - **Decision window roadmap & net centric program reviews**

- **Work across and within the system** **via existing processes and authorities**

  - Flow user operational needs to GIG segments – JCIDS inputs

  - Assure programs meet net centric criteria – Acquisition process

  - Delivery synchronized capability to the field - PBBS

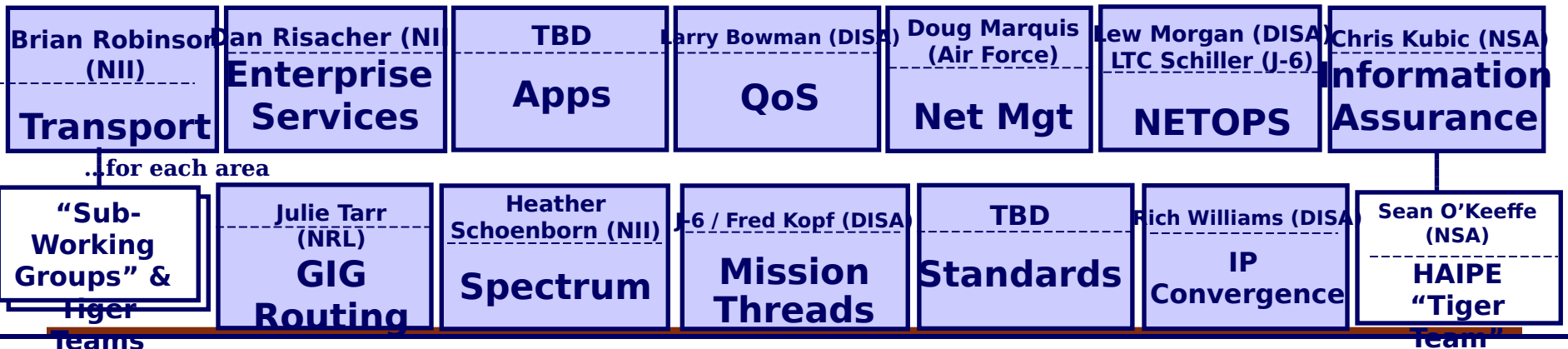*es technical focus to help decision makers bring GIG programs*

# GIG E2E Systems Engineering Advisory Activity

**ASD(NII) / DoD CIO**

**Senior GIG Systems Engineer (NII)**
**Mr. Mike Kern (NII)**

**Chair:** Senior GIG Systems Engineer (NII)

**GIG Senior Systems Engineering Board**

**GIG E2E Evaluation Facilities (NRL)**

**Members: Senior Sys Engineering Rep from:**
Army, Navy, AF, USMC, AT&L, USD(I), DOT&E, Joint Staff J-6, STRATCOM, JFCOM, IC-CIO, DISA, MDA, NSA GIG IA SPO, TCO, TCM MJPO, GIG-BE SPO, JTRS JPO, NCES SPO, GIG Architect, & E2E Evaluation Facilities (NRL)

**GIG End-to-End Systems Engineering Working Group**
POC: Brian Robinson (NII)

| Brian Robinson (NII) | Dan Risacher (NII) | TBD | Larry Bowman (DISA) | Doug Marquis (Air Force) | Lew Morgan (DISA) LTC Schiller (J-6) | Chris Kubic (NSA) |
|---|---|---|---|---|---|---|
| **Transport** | **Enterprise Services** | **Apps** | **QoS** | **Net Mgt** | **NETOPS** | **Information Assurance** |

...for each area

| "Sub-Working Groups" & Tiger Teams | Julie Tarr (NRL) **GIG Routing** | Heather Schoenborn (NII) **Spectrum** | J-6 / Fred Kopf (DISA) **Mission Threads** | TBD **Standards** | Rich Williams (DISA) **IP Convergence** | Sean O'Keeffe (NSA) **HAIPE "Tiger Team"** |
|---|---|---|---|---|---|---|

# *Cross-Cutting Issues Are First Priority*

- **Transport**
    - Convergence of voice, video, & data to an all IP infrastructure
    - IPv6 rollout and transition architecture
    - JTRS deployment and capability strategy

- **GIG Services**
    - Deployment of foundational services (e.g., Directory)
    - Performance engineering
    - Core service delivery to the tactical edge

- **Information Assurance**
    - Balancing "need-to-share" and "need-to-protect"
    - HAIPIS 3.0 standard

- **Network Operations**
    - Integration of enterprise services and IA to provide a GIG management capability
    - Net Ops Situational Awareness capability to support planning and execution

# *GIG E2E SE Is Making A Difference*

- **Organization**
  - Charter signed (17 organizations) August 2004
  - Senior System Engineering Board Operating
  - NII net centric system engineer reporting to the ASD

- **Information Assurance**
  - GIG IA architecture defined, ~2200 page document published, vetted
  - HAIPIS 2.0 published May 2004 with network extensions

- **Architecture  Implementation**
  - Single black core routing architecture & transition approach to black service
  - Initial DoDAF Net Ops Net Mgt Products  Arch, AV-1, OV-1
  - Threads:  Initial threads interoperability analysis completed Aug '04
  - QoS:   Concepts and allocation across multiple networks, systems in work
  - Software:  Software Communications Architecture (SCA) 3.0
  - War fighter Integration:  J6/STRAT, future network management definitions
  - Test:  GIG-EF initial build ('04); initial experiments (Sep '04)

- **Net Centric Program Reviews are in place and lowering risk today**

# *Industry has a major role – stay in touch*

**OASD(NII) MILCOM Systems Engineering presentations will be posted on the OASD(NII)/DoD CIO public web site: http:www.dod.mil/nii**

Assistant Secretary of Defense
Networks & Information Integration
Chief Information Officer, Department of Defense

* Organization   * Biographies   * Document Achieve   * FAQ   * Site Info   * Si

**Welcome....**
Our ability to leverage the power of information will be key to our success in the 21st Century. I am committed to:
- *make information available on a network that people depend on and trust*
- *populate the network with new, dynamic sources of information to defeat the enemy*
- *deny the enemy information advantages and exploit weakness to support Network Centric Warfare and the transformation of DoD business processes.*

*...Linton Wells II*

**Goals**
Goal #1 - Make information available on a network that people depend on and trust.
Goal #2 - Populate the network with new, dynamic sources of information to defeat the enemy
Goal #3 - Deny the enemy comparable advantages and exploit weaknesses

| Search the NII Site for: | | |
|---|---|---|
| **Tip: put phrases in quotes:** *"Information Assurance* | | SUBMIT |

**More Search Options: Search Help**          **Enter: MILCOM**

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# *Summary*

- **The Net Centric GIG enables transformational warfare**

- **End-to-End system engineering will help converge and field the system**

- **The SE team is delivering key technical products & making a difference now**

- **This collaborative initiative is working well at all levels**

- **Industry has a critical role, we look forward to your participation**